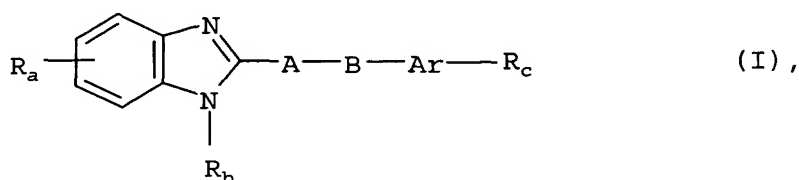


**What is claimed is:**

1. A method of treating or preventing diseases selected from the group consisting of systemic inflammatory response syndrome (SIRS), sepsis and bacteranemia which comprises administering to a patient in need thereof a therapeutically effective amount of a benzamidazole pharmaceutical composition of general formula (I)



10 wherein

Ar denotes a phenylene or naphthylene group optionally substituted by a fluorine, chlorine or bromine atom, by a trifluoromethyl, C<sub>1-3</sub>-alkyl or C<sub>1-3</sub>-alkoxy group,

15 a thienylene, thiazolylene, pyridinylene, pyrimidinylene, pyrazinylene or pyridazinylene group optionally substituted in the carbon skeleton by a C<sub>1-3</sub>-alkyl group,

A denotes a C<sub>1-3</sub>-alkylene group,

20

B denotes an oxygen or sulphur atom, a methylene, carbonyl, sulphinyl or sulphonyl group, an imino group optionally substituted by a C<sub>1-3</sub>-alkyl group wherein the alkyl moiety may be mono- or disubstituted by a carboxy group,

25

R<sub>a</sub> denotes a R<sub>1</sub>-CO-C<sub>3-5</sub>-cycloalkyl group wherein

R<sub>1</sub> denotes a C<sub>1-3</sub>-alkoxy, amino, C<sub>1-4</sub>-alkylamino or di-(C<sub>1-4</sub>-alkyl)-amino group, wherein in each case the alkyl moiety may be substituted by a carboxy group,

5 a 4- to 7-membered cycloalkyleneimino or cycloalkenyleneimino group which may be substituted by one or two C<sub>1-3</sub>-alkyl groups, while an alkyl substituent may simultaneously be substituted by a hydroxy, C<sub>1-3</sub>-alkoxy, carboxy, carboxy-C<sub>1-3</sub>-alkoxy, carboxy-C<sub>1-3</sub>-alkylamino, N-(C<sub>1-3</sub>-alkyl)-N-(carboxy-C<sub>1-3</sub>-alkyl)-amino, carboxy-C<sub>1-3</sub>-alkylaminocarbonyl,  
 10 N-(C<sub>1-3</sub>-alkyl)-N-(carboxy-C<sub>1-3</sub>-alkyl)-aminocarbonyl, carboxy-C<sub>1-3</sub>-alkylaminocarbonylamino, 1-(C<sub>1-3</sub>-alkyl)-3-(carboxy-C<sub>1-3</sub>-alkyl)-aminocarbonylamino, 3-(C<sub>1-3</sub>-alkyl)-3-(carboxy-C<sub>1-3</sub>-alkyl)-aminocarbonylamino or 1,3-di-(C<sub>1-3</sub>-alkyl)-3-(carboxy-C<sub>1-3</sub>-alkyl)-aminocarbonylamino group,

15 a 4- to 7-membered cycloalkyleneimino group substituted by a hydroxy group,

20 a 5- to 7-membered cycloalkyleneimino group optionally substituted by a C<sub>1-3</sub>-alkyl group, to which a phenyl ring is fused via two adjacent carbon atoms,

a morpholino, piperazino, N-(C<sub>1-3</sub>-alkyl)-piperazino, pyrrolino, 3,4-dehydro-piperidino or pyrrol-1-yl group,

25 a R<sub>2</sub>-CX-C<sub>3-5</sub>-cycloalkyl group wherein

R<sub>2</sub> denotes a phenyl, naphthyl or monocyclic 5- or 6-membered heteroaryl group optionally substituted by a C<sub>1-3</sub>-alkyl group, while the 6-membered  
 30 heteroaryl group contains one, two or three nitrogen atoms and the 5-membered heteroaryl group contains an imino group optionally

substituted by a C<sub>1-3</sub>-alkyl group, an oxygen or sulphur atom or an imino group optionally substituted by a C<sub>1-3</sub>-alkyl group and an oxygen or sulphur atom or one or two nitrogen atoms and the abovementioned alkyl substituent may be substituted by a carboxy, carboxy-C<sub>1-3</sub>-alkoxy, carboxy-C<sub>1-3</sub>-alkylamino or N-(C<sub>1-3</sub>-alkyl)-carboxy-C<sub>1-3</sub>-alkylamino group, and

X denotes an oxygen atom, a C<sub>1-3</sub>-alkylimino, C<sub>1-3</sub>-alkoxyimino, C<sub>1-3</sub>-alkylhydrazino, di-(C<sub>1-3</sub>-alkyl)-hydrazino, C<sub>2-4</sub>-alkanoylhydrazino, N-(C<sub>1-3</sub>-alkyl)-C<sub>2-4</sub>-alkanoylhydrazino or C<sub>1-3</sub>-alkylidene group each of which may be substituted by a carboxy group in the alkyl or alkanoyl moiety or in the alkyl and alkanoyl moiety,

a C<sub>1-3</sub>-alkyl or C<sub>3-5</sub>-cycloalkyl group substituted by an imidazole or imidazolone group, wherein

the imidazole ring may be substituted by a phenyl or carboxy group and by one or two C<sub>1-3</sub>-alkyl groups or by one, two or three C<sub>1-3</sub>-alkyl groups, while the substituents may be identical or different and one of the abovementioned alkyl substituents may simultaneously be substituted by a carboxy group or in the 2 or 3 position by an amino, C<sub>2-4</sub>-alkanoylamino, C<sub>1-3</sub>-alkylamino, N-(C<sub>2-4</sub>-alkanoyl)-C<sub>1-3</sub>-alkylamino or di-(C<sub>1-3</sub>-alkyl)-amino group, and

the imidazolone ring may be substituted by a C<sub>1-3</sub>-alkyl group, while the alkyl substituent may be substituted by a carboxy group or in the 2 or 3 position by an amino, C<sub>2-4</sub>-alkanoylamino, C<sub>1-3</sub>-alkylamino, N-(C<sub>2-4</sub>-alkanoyl)-C<sub>1-3</sub>-alkylamino or di-(C<sub>1-3</sub>-alkyl)-amino group, and

additionally a phenyl or pyridine ring may be fused to the abovementioned imidazole and imidazolone rings via two adjacent carbon atoms,

an imidazolidin-2,4-dion-5-yl group which may be substituted by one or two C<sub>1-3</sub>-alkyl groups, while simultaneously an alkyl substituent may be substituted by a carboxy group,

5 a C<sub>1-4</sub>-alkyl group which is substituted

by a C<sub>1-3</sub>-alkyl-Y<sub>1</sub>-C<sub>1-3</sub>-alkyl, HOOC-C<sub>1-3</sub>-alkyl-Y<sub>1</sub>-C<sub>1-3</sub>-alkyl, tetrazolyl-C<sub>1-3</sub>-alkyl-Y<sub>2</sub>, R<sub>3</sub>NR<sub>4</sub> or R<sub>3</sub>NR<sub>4</sub>-C<sub>1-3</sub>-alkyl group and

10 by an isoxazolidinylcarbonyl group optionally substituted by a C<sub>1-3</sub>-alkyl group, by a pyrrolinocarbonyl, 3,4-dehydro-piperidinocarbonyl, pyrrol-1-yl-carbonyl, carboxy, aminocarbonyl, C<sub>1-3</sub>-alkylaminocarbonyl, di-(C<sub>1-3</sub>-alkyl)-aminocarbonyl or 4- to 7-membered cycloalkyleneiminocarbonyl group, while in the abovementioned groups the cycloalkyleneimino moiety may be substituted by one or two C<sub>1-3</sub>-alkyl groups and simultaneously in each case an alkyl moiety or alkyl substituent of the abovementioned C<sub>1-3</sub>-alkylaminocarbonyl, di-(C<sub>1-3</sub>-alkyl)-aminocarbonyl or cycloalkyleneiminocarbonyl groups may be substituted by a carboxy group, and the remaining hydrogen atoms of the C<sub>1-4</sub>-alkyl group may be wholly or partly replaced by fluorine atoms, wherein

15

20

R<sub>3</sub> denotes a hydrogen atom or a C<sub>1-3</sub>-alkyl group optionally substituted by a carboxy group and

25 R<sub>4</sub> denotes a hydrogen atom, a C<sub>1-3</sub>-alkyl-Y<sub>1</sub>-C<sub>1-3</sub>-alkyl-Y<sub>2</sub>, carboxy-C<sub>1-3</sub>-alkyl-Y<sub>1</sub>-C<sub>1-3</sub>-alkyl-Y<sub>2</sub>, C<sub>1-3</sub>-alkyl-Y<sub>2</sub> or carboxy-C<sub>1-3</sub>-alkyl-Y<sub>2</sub> group or

R<sub>3</sub> and R<sub>4</sub> together with the nitrogen atom between them denote a 4- to 7-membered cycloalkyleneimino group optionally substituted by a carboxy, C<sub>1-3</sub>-alkyl or carboxy-C<sub>1-3</sub>-alkyl group, wherein

30

$Y_1$  denotes a carbon-carbon bond, an oxygen atom, a sulphenyl, sulphinyl, sulphonyl, -NH, -NH-CO or -NH-CO-NH group and

5  $Y_2$  denotes a carbon-nitrogen bond or a carbonyl, sulphonyl, imino or -NH-CO group, while the carbonyl group of the -NH-CO group is linked to the nitrogen atom of the  $R_3NR_4$  group, and the imino groups mentioned in the definition of the groups  $Y_1$  and  $Y_2$  may each additionally be substituted by a  $C_{1-3}$ -alkyl or carboxy- $C_{1-3}$ -alkyl group,

10 a  $C_{1-3}$ -alkyl or  $C_{3-5}$ -cycloalkyl group substituted by a  $R_5NR_6$  group, wherein

$R_5$  denotes a hydrogen atom, a  $C_{1-3}$ -alkyl,  $C_{5-7}$ -cycloalkyl, phenylcarbonyl, phenylsulphonyl or pyridinyl group and

15  $R_6$  denotes a  $C_{1-3}$ -alkyl, carboxy- $C_{1-3}$ -alkyl or carboxy- $C_{1-3}$ -alkylcarbonyl group,

a  $C_{1-3}$ -alkyl group which is substituted by a  $C_{2-4}$ -alkanoyl or  $C_{5-7}$ -cyclo-  
20 alkanoyl group and by a  $C_{1-3}$ -alkyl group substituted by a chlorine, bromine or iodine atom,

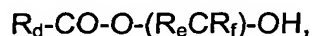
$R_b$  denotes a hydrogen atom or a  $C_{1-3}$ -alkyl group and

25  $R_c$  denotes a cyano group or an amidino group optionally substituted by one or two  $C_{1-3}$ -alkyl groups, wherein

the carboxy groups mentioned in the definition of the abovementioned groups may also be replaced by a group which may be converted *in vivo*  
30 into a carboxy group or by a group which is negatively charged under physiological conditions or

the amino and imino groups mentioned in the definition of the abovementioned groups may also be substituted by a group which can be cleaved *in vivo*, while

5 by a group which may be converted into a carboxy group *in vivo* is meant a hydroxymethyl group, a carboxy group esterified with an alcohol wherein the alcoholic moiety is a C<sub>1-6</sub>-alkanol, a phenyl-C<sub>1-3</sub>-alkanol, a C<sub>3-9</sub>-cycloalkanol, while a C<sub>5-8</sub>-cycloalkanol may additionally be substituted by one or two C<sub>1-3</sub>-alkyl groups, a C<sub>5-8</sub>-cycloalkanol wherein a methylene group  
 10 in the 3 or 4 position is replaced by an oxygen atom or by an imino group optionally substituted by a C<sub>1-3</sub>-alkyl, phenyl-C<sub>1-3</sub>-alkyl, phenyl-C<sub>1-3</sub>-alkoxycarbonyl or C<sub>2-6</sub>-alkanoyl group and the cycloalkanol moiety may additionally be substituted by one or two C<sub>1-3</sub>-alkyl groups, a C<sub>4-7</sub>-cycloalkenol, a C<sub>3-5</sub>-alkenol, a phenyl-C<sub>3-5</sub>-alkenol, a C<sub>3-5</sub>-alkynol or phenyl-C<sub>3-5</sub>-alkynol, with the proviso that no bond to the oxygen atom starts from a  
 15 carbon atom which carries a double or triple bond, a C<sub>3-8</sub>-cycloalkyl-C<sub>1-3</sub>-alkanol, a bicycloalkanol with a total of 8 to 10 carbon atoms which may additionally be substituted in the bicycloalkyl moiety by one or two C<sub>1-3</sub>-alkyl groups, a 1,3-dihydro-3-oxo-1-isobenzofuranol or an alcohol of  
 20 formula



wherein

25 R<sub>d</sub> denotes a C<sub>1-8</sub>-alkyl, C<sub>5-7</sub>-cycloalkyl, phenyl or phenyl-C<sub>1-3</sub>-alkyl group

R<sub>e</sub> denotes a hydrogen atom, a C<sub>1-3</sub>-alkyl, C<sub>5-7</sub>-cycloalkyl or phenyl group and

30 R<sub>f</sub> denotes a hydrogen atom or a C<sub>1-3</sub>-alkyl group,

by a group which is negatively charged under physiological conditions is meant a tetrazol-5-yl, phenylcarbonylaminocarbonyl, trifluoromethylcarbonylaminocarbonyl, C<sub>1-6</sub>-alkylsulphonylamino, phenylsulphonylamino, benzylsulphonylamino, trifluoromethylsulphonylamino, C<sub>1-6</sub>-alkylsulphonylaminocarbonyl, phenylsulphonylaminocarbonyl, benzylsulphonylaminocarbonyl or perfluoro-C<sub>1-6</sub>-alkylsulphonylaminocarbonyl group

and by a group which can be cleaved from an imino or amino group *in vivo* is meant a hydroxy group, a benzoyl group optionally mono- or disubstituted by fluorine, chlorine, bromine or iodine atoms, by C<sub>1-3</sub>-alkyl or C<sub>1-3</sub>-alkoxy groups, while the substituents may be identical or different, a pyridinoyl group or a C<sub>1-16</sub>-alkanoyl group, a 3,3,3-trichloropropionyl or allyloxycarbonyl group, a C<sub>1-16</sub>-alkoxycarbonyl or C<sub>1-16</sub>-alkylcarbonyloxy group, wherein hydrogen atoms may be wholly or partly replaced by fluorine or chlorine atoms, a phenyl-C<sub>1-6</sub>-alkoxycarbonyl group, a 3-amino-propionyl group wherein the amino group may be mono- or disubstituted by C<sub>1-6</sub>-alkyl or C<sub>3-7</sub>-cycloalkyl groups and the substituents may be identical or different, a C<sub>1-3</sub>-alkylsulphonyl-C<sub>2-4</sub>-alkoxycarbonyl, C<sub>1-3</sub>-alkoxy-C<sub>2-4</sub>-alkoxy-C<sub>2-4</sub>-alkoxycarbonyl, R<sub>d</sub>-CO-O-(R<sub>d</sub>CR<sub>f</sub>)-O-CO, C<sub>1-6</sub>-alkyl-CO-NH-(R<sub>g</sub>CR<sub>h</sub>)-O-CO or C<sub>1-6</sub>-alkyl-CO-O-(R<sub>g</sub>CR<sub>h</sub>)-(R<sub>g</sub>CR<sub>h</sub>)-O-CO group, wherein R<sub>d</sub> to R<sub>f</sub> are as hereinbefore defined and

R<sub>g</sub> and R<sub>h</sub>, which may be identical or different, denote hydrogen atoms or C<sub>1-3</sub>-alkyl groups,

the tautomers, stereoisomers, mixtures thereof and the salts thereof,

optionally in the form of the pharmaceutically acceptable acid addition salts thereof, as well as optionally in the form of the hydrates or solvates thereof,

for preparing a pharmaceutical composition for the prevention or treatment of diseases from the group consisting of systemic inflammatory response syndrome (SIRS), sepsis and bacteraemia.

- 5     **2.**    The method according to claim 1, wherein the benzimidazole used is (R)-2-(4-amidinophenylaminomethyl)-1-methyl-5-[1-(carboxymethylamino)-1-(pyrrolidinocarbonyl)-ethyl]-benzimidazole, optionally in the form of the pharmaceutically acceptable acid addition salts thereof, and optionally in the form of the hydrates or solvates thereof.
- 10
- 3.**    The method according to claim 2, wherein the monohydrochloride salt of (R)-2-(4-amidinophenylaminomethyl)-1-methyl-5-[1-(carboxymethylamino)-1-(pyrrolidinocarbonyl)-ethyl]-benzimidazole is used.
- 15     **4.**    The method according to claim 1, wherein the condition is selected from the group consisting of SIRS caused by gram-positive pathogens, SIRS caused by gram-negative pathogens, SIRS caused by viruses, SIRS caused by single-cell eukaryotic parasites, SIRS caused by fungi, SIRS without organ failure, SIRS with organ failure, septic shock, septic syndrome, SIRS caused by pancreatitis, SIRS caused by systemic ischaemia, SIRS caused by organ-limited ischaemia, SIRS caused by trauma, SIRS occurring in connection with tumour diseases, SIRS caused by tissue damage, SIRS caused by burns, SIRS occurring after lengthy operations, SIRS as a consequence of organ transplants, SIRS as the result of shock of various kinds, SIRS caused by blood loss, SIRS as the result of cardiovascular failure, SIRS as the result of immuno-mediated organ failure, SIRS as the result of inflammatory reactions, SIRS as the result of treatment with inflammation mediators such as for example tumour necrosis factor alpha and/or beta and/or other cytokines, and also consisting of lung damage, acute lung injury and ARDS (acute respiraotry distress syndrome), acute cardiovascular failure, organ failure after resuscitation, shock, kidney failure, cardiovascular failure,
- 20
- 25
- 30



haematological damage, acidosis and multiple organ dysfunction syndrome (MODS) occurring in connection with SIRS.

- 5       **5.**    The method of claim 1, wherein the pharmaceutical composition is intended as an accompanying treatment for bacteraemia.
- 6.**    The method of claim 1, wherein the pharmaceutical composition is intended for subcutaneous or parenteral and particularly intravenous administration.
- 10    **7.**    The method of claim 1 further comprised of the step of co-administration of an inhibitor of platelet function.
- 8.**    The method of claim 7 wherein the inhibitor of platelet function is selected from the list consisting of acetylsalicylic acid, fibrinogen receptor antagonists,  
15       inhibitors of ADP-induced aggregation, P<sub>2</sub>T receptor antagonists and combined thromboxane receptor antagonists / synthetase inhibitors.
- 9.**    The method of claim 1 further comprised of the step of co-administration of a thrombolytically active substance.  
20
- 10.**   The method of claim 9 wherein the thrombolytically active substance is selected from the list consisting of alteplase, reteplase, tenecteplase, urokinase, staphylokinase and streptokinase.
- 25    **11.**   The method of claim 1 further comprised of the step of co-administration of physiological activators and inhibitors of the clotting system and their recombinant analogues.
- 30    **12.**   The method of claim 11 wherein the physiological activators and inhibitors of the clotting system are selected from the group consisting of Protein C, recombinant human activated Protein C, TFPI and antithrombin.

13. The method of claim 1 further comprised of the step of co-administration of substances with an antagonistic effect on endotoxins.

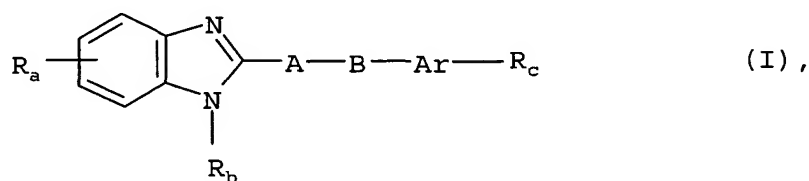
5 14. The method of claim 1 further comprised of the co-administration compounds selected from the list consisting of interleukins, TNF, bradykinin, prostaglandins, cyclooxygenases, NO, platelet activating factor, acetylhydrolases, inflammation inhibitors, immunosuppressant substances, antibiotics and catecholamines

10

15. Pharmaceutical composition comprised of

(a) at least one active substance selected from the group of benzimidazoles of general formula (I)

15



wherein

20 Ar denotes a phenylene or naphthylene group optionally substituted by a fluorine, chlorine or bromine atom, by a trifluoromethyl, C<sub>1-3</sub>-alkyl or C<sub>1-3</sub>-alkoxy group,

a thienylene, thiazolylene, pyridinylene, pyrimidinylene, pyrazinylene or pyridazinylene group optionally substituted in the carbon skeleton by a C<sub>1-3</sub>-alkyl group,

25

A denotes a C<sub>1-3</sub>-alkylene group,

B denotes an oxygen or sulphur atom, a methylene, carbonyl, sulphinyl or sulphonyl group, an imino group optionally substituted by a C<sub>1-3</sub>-alkyl group wherein the alkyl moiety may be mono- or disubstituted by a carboxy group,

5 R<sub>a</sub> denotes a R<sub>1</sub>-CO-C<sub>3-5</sub>-cycloalkyl group wherein

R<sub>1</sub> denotes a C<sub>1-3</sub>-alkoxy, amino, C<sub>1-4</sub>-alkylamino or di-(C<sub>1-4</sub>-alkyl)-amino group, wherein in each case the alkyl moiety may be substituted by a carboxy group,

10

a 4- to 7-membered cycloalkyleneimino or cycloalkenyleneimino group which may be substituted by one or two C<sub>1-3</sub>-alkyl groups, while an alkyl substituent may simultaneously be substituted by a hydroxy, C<sub>1-3</sub>-alkoxy, carboxy, carboxy-C<sub>1-3</sub>-alkoxy, carboxy-C<sub>1-3</sub>-alkylamino, N-(C<sub>1-3</sub>-alkyl)-

15

N-(carboxy-C<sub>1-3</sub>-alkyl)-amino, carboxy-C<sub>1-3</sub>-alkylaminocarbonyl, N-(C<sub>1-3</sub>-alkyl)-N-(carboxy-C<sub>1-3</sub>-alkyl)-aminocarbonyl, carboxy-C<sub>1-3</sub>-alkylaminocarbonylamino, 1-(C<sub>1-3</sub>-alkyl)-3-(carboxy-C<sub>1-3</sub>-alkyl)-aminocarbonylamino, 3-(C<sub>1-3</sub>-alkyl)-3-(carboxy-C<sub>1-3</sub>-alkyl)-aminocarbonylamino or 1,3-di-(C<sub>1-3</sub>-alkyl)-3-(carboxy-C<sub>1-3</sub>-alkyl)-aminocarbonylamino group,

20

a 4- to 7-membered cycloalkyleneimino group substituted by a hydroxy group,

25

a 5- to 7-membered cycloalkyleneimino group optionally substituted by a C<sub>1-3</sub>-alkyl group, to which a phenyl ring is fused via two adjacent carbon atoms,

30

a morpholino, piperazino, N-(C<sub>1-3</sub>-alkyl)-piperazino, pyrrolino, 3,4-dehydro-piperidino or pyrrol-1-yl group,

a  $R_2$ -CX- $C_{3-5}$ -cycloalkyl group wherein

$R_2$  denotes a phenyl, naphthyl or monocyclic 5- or 6-membered heteroaryl group optionally substituted by a  $C_{1-3}$ -alkyl group, while the 6-membered heteroaryl group contains one, two or three nitrogen atoms and the 5-membered heteroaryl group contains an imino group optionally substituted by a  $C_{1-3}$ -alkyl group, an oxygen or sulphur atom or an imino group optionally substituted by a  $C_{1-3}$ -alkyl group and an oxygen or sulphur atom or one or two nitrogen atoms and the abovementioned alkyl substituent may be substituted by a carboxy, carboxy- $C_{1-3}$ -alkoxy, carboxy- $C_{1-3}$ -alkylamino or N-( $C_{1-3}$ -alkyl)-carboxy- $C_{1-3}$ -alkylamino group, and

X denotes an oxygen atom, a  $C_{1-3}$ -alkylimino,  $C_{1-3}$ -alkoxyimino,  $C_{1-3}$ -alkylhydrazino, di-( $C_{1-3}$ -alkyl)-hydrazino,  $C_{2-4}$ -alkanoylhydrazino, N-( $C_{1-3}$ -alkyl)- $C_{2-4}$ -alkanoylhydrazino or  $C_{1-3}$ -alkylidene group each of which may be substituted by a carboxy group in the alkyl or alkanoyl moiety or in the alkyl and alkanoyl moiety,

a  $C_{1-3}$ -alkyl or  $C_{3-5}$ -cycloalkyl group substituted by an imidazole or imidazolone group, wherein

the imidazole ring may be substituted by a phenyl or carboxy group and by one or two  $C_{1-3}$ -alkyl groups or by one, two or three  $C_{1-3}$ -alkyl groups, while the substituents may be identical or different and one of the abovementioned alkyl substituents may simultaneously be substituted by a carboxy group or in the 2 or 3 position by an amino,  $C_{2-4}$ -alkanoylamino,  $C_{1-3}$ -alkylamino, N-( $C_{2-4}$ -alkanoyl)- $C_{1-3}$ -alkylamino or di-( $C_{1-3}$ -alkyl)-amino group, and

the imidazolone ring may be substituted by a  $C_{1-3}$ -alkyl group, while the alkyl substituent may be substituted by a carboxy group or in the 2 or 3

position by an amino, C<sub>2-4</sub>-alkanoylamino, C<sub>1-3</sub>-alkylamino,  
N-(C<sub>2-4</sub>-alkanoyl)-C<sub>1-3</sub>-alkylamino or di-(C<sub>1-3</sub>-alkyl)-amino group, and

5 additionally a phenyl or pyridine ring may be fused to the abovementioned  
imidazole and imidazolone rings via two adjacent carbon atoms,

an imidazolidin-2,4-dion-5-yl group which may be substituted by one or two  
C<sub>1-3</sub>-alkyl groups, while simultaneously an alkyl substituent may be  
substituted by a carboxy group,

10 a C<sub>1-4</sub>-alkyl group which is substituted

by a C<sub>1-3</sub>-alkyl-Y<sub>1</sub>-C<sub>1-3</sub>-alkyl, HOOC-C<sub>1-3</sub>-alkyl-Y<sub>1</sub>-C<sub>1-3</sub>-alkyl, tetrazolyl-  
C<sub>1-3</sub>-alkyl-Y<sub>2</sub>, R<sub>3</sub>NR<sub>4</sub> or R<sub>3</sub>NR<sub>4</sub>-C<sub>1-3</sub>-alkyl group and

15 by an isoxazolidinylcarbonyl group optionally substituted by a C<sub>1-3</sub>-alkyl  
group, by a pyrrolinocarbonyl, 3,4-dehydro-piperidinocarbonyl, pyrrol-1-yl-  
carbonyl, carboxy, aminocarbonyl, C<sub>1-3</sub>-alkylaminocarbonyl, di-(C<sub>1-3</sub>-alkyl)-  
aminocarbonyl or 4- to 7-membered cycloalkyleneiminocarbonyl group,  
20 while in the abovementioned groups the cycloalkyleneimino moiety may be  
substituted by one or two C<sub>1-3</sub>-alkyl groups and simultaneously in each case  
an alkyl moiety or alkyl substituent of the abovementioned  
C<sub>1-3</sub>-alkylaminocarbonyl, di-(C<sub>1-3</sub>-alkyl)-aminocarbonyl or  
cycloalkyleneiminocarbonyl groups may be substituted by a carboxy group,  
25 and the remaining hydrogen atoms of the C<sub>1-4</sub>-alkyl group may be wholly or  
partly replaced by fluorine atoms, wherein

R<sub>3</sub> denotes a hydrogen atom or a C<sub>1-3</sub>-alkyl group optionally  
substituted by a carboxy group and

$R_4$  denotes a hydrogen atom, a  $C_{1-3}$ -alkyl- $Y_1$ - $C_{1-3}$ -alkyl- $Y_2$ , carboxy- $C_{1-3}$ -alkyl- $Y_1$ - $C_{1-3}$ -alkyl- $Y_2$ ,  $C_{1-3}$ -alkyl- $Y_2$  or carboxy- $C_{1-3}$ -alkyl- $Y_2$  group or

5  $R_3$  and  $R_4$  together with the nitrogen atom between them denote a 4- to 7-membered cycloalkyleneimino group optionally substituted by a carboxy,  $C_{1-3}$ -alkyl or carboxy- $C_{1-3}$ -alkyl group, wherein

10  $Y_1$  denotes a carbon-carbon bond, an oxygen atom, a sulphenyl, sulphinyl, sulphonyl, -NH, -NH-CO or -NH-CO-NH group and

$Y_2$  denotes a carbon-nitrogen bond or a carbonyl, sulphonyl, imino or -NH-CO group, while the carbonyl group of the -NH-CO group is linked to the nitrogen atom of the  $R_3NR_4$  group, and the imino groups mentioned in  
15 the definition of the groups  $Y_1$  and  $Y_2$  may each additionally be substituted by a  $C_{1-3}$ -alkyl or carboxy- $C_{1-3}$ -alkyl group,

a  $C_{1-3}$ -alkyl or  $C_{3-5}$ -cycloalkyl group substituted by a  $R_5NR_6$  group, wherein

20  $R_5$  denotes a hydrogen atom, a  $C_{1-3}$ -alkyl,  $C_{5-7}$ -cycloalkyl, phenylcarbonyl, phenylsulphonyl or pyridinyl group and

$R_6$  denotes a  $C_{1-3}$ -alkyl, carboxy- $C_{1-3}$ -alkyl or carboxy- $C_{1-3}$ -alkylcarbonyl group,

25 a  $C_{1-3}$ -alkyl group which is substituted by a  $C_{2-4}$ -alkanoyl or  $C_{5-7}$ -cyclo-alkanoyl group and by a  $C_{1-3}$ -alkyl group substituted by a chlorine, bromine or iodine atom,

30  $R_b$  denotes a hydrogen atom or a  $C_{1-3}$ -alkyl group and

$R_c$  denotes a cyano group or an amidino group optionally substituted by one or two  $C_{1-3}$ -alkyl groups, wherein

5 the carboxy groups mentioned in the definition of the abovementioned groups may also be replaced by a group which may be converted *in vivo* into a carboxy group or by a group which is negatively charged under physiological conditions or

10 the amino and imino groups mentioned in the definition of the abovementioned groups may also be substituted by a group which can be cleaved *in vivo*, wherein

15 by a group which may be converted into a carboxy group *in vivo* is meant a hydroxymethyl group, a carboxy group esterified with an alcohol wherein the alcoholic moiety is a  $C_{1-6}$ -alkanol, a phenyl- $C_{1-3}$ -alkanol, a  $C_{3-9}$ -cycloalkanol, while a  $C_{5-8}$ -cycloalkanol may additionally be substituted by one or two  $C_{1-3}$ -alkyl groups, a  $C_{5-8}$ -cycloalkanol wherein a methylene group in the 3 or 4 position is replaced by an oxygen atom or by an imino group optionally substituted by a  $C_{1-3}$ -alkyl, phenyl- $C_{1-3}$ -alkyl, phenyl- $C_{1-3}$ -alkoxycarbonyl or  
20  $C_{2-6}$ -alkanoyl group and the cycloalkanol moiety may additionally be substituted by one or two  $C_{1-3}$ -alkyl groups, a  $C_{4-7}$ -cycloalkenol, a  $C_{3-5}$ -alkenol, a phenyl- $C_{3-5}$ -alkenol, a  $C_{3-5}$ -alkynol or phenyl-  $C_{3-5}$ -alkynol,

25 with the proviso that no bond to the oxygen atom starts from a carbon atom which carries a double or triple bond, a  $C_{3-8}$ -cycloalkyl- $C_{1-3}$ -alkanol, a bicycloalkanol with a total of 8 to 10 carbon atoms which may additionally be substituted in the bicycloalkyl moiety by one or two  $C_{1-3}$ -alkyl groups, a 1,3-dihydro-3-oxo-1-isobenzofuranol or an alcohol of formula

30  $R_d\text{-CO-O-(R}_e\text{CR}_f\text{)-OH,}$

wherein

$R_d$  denotes a  $C_{1-8}$ -alkyl,  $C_{5-7}$ -cycloalkyl, phenyl or phenyl-  $C_{1-3}$ -alkyl group

5  $R_e$  denotes a hydrogen atom, a  $C_{1-3}$ -alkyl,  $C_{5-7}$ -cycloalkyl or phenyl group and

$R_f$  denotes a hydrogen atom or a  $C_{1-3}$ -alkyl group,

by a group which is negatively charged under physiological conditions is  
 10 meant a tetrazol-5-yl, phenylcarbonylaminocarbonyl,  
 trifluoromethylcarbonylaminocarbonyl,  $C_{1-6}$ -alkylsulphonylamino,  
 phenylsulphonylamino, benzylsulphonylamino,  
 trifluoromethylsulphonylamino,  $C_{1-6}$ -alkylsulphonylaminocarbonyl,  
 phenylsulphonylaminocarbonyl, benzylsulphonylaminocarbonyl or perfluoro-  
 15  $C_{1-6}$ -alkylsulphonylaminocarbonyl group

and by a group which can be cleaved from an imino or amino group *in vivo* is  
 meant a hydroxy group, a benzoyl group optionally mono- or disubstituted by  
 fluorine, chlorine, bromine or iodine atoms, by  $C_{1-3}$ -alkyl or  $C_{1-3}$ -alkoxy  
 20 groups, while the substituents may be identical or different, a pyridinoyl group  
 or a  $C_{1-16}$ -alkanoyl group, a 3,3,3-trichloropropionyl or allyloxycarbonyl group,  
 a  $C_{1-16}$ -alkoxycarbonyl or  $C_{1-16}$ -alkylcarbonyloxy group, wherein hydrogen  
 atoms may be wholly or partly replaced by fluorine or chlorine atoms, a  
 phenyl- $C_{1-6}$ -alkoxycarbonyl group, a 3-amino-propionyl group wherein the  
 25 amino group may be mono- or disubstituted by  $C_{1-6}$ -alkyl or  $C_{3-7}$ -cycloalkyl  
 groups and the substituents may be identical or different, a  
 $C_{1-3}$ -alkylsulphonyl- $C_{2-4}$ -alkoxycarbonyl,  $C_{1-3}$ -alkoxy- $C_{2-4}$ -alkoxy-  
 $C_{2-4}$ -alkoxycarbonyl,  $R_d$ -CO-O- $(R_dCR_f)$ -O-CO,  $C_{1-6}$ -alkyl-CO-NH-  
 $(R_gCR_h)$ -O-CO or  $C_{1-6}$ -alkyl-CO-O- $(R_gCR_h)$ - $(R_gCR_h)$ -O-CO group, wherein  $R_d$   
 30 to  $R_f$  are as hereinbefore defined and



$R_g$  and  $R_h$ , which may be identical or different, denote hydrogen atoms or  $C_{1-3}$ -alkyl groups,

the tautomers, stereoisomers, mixtures thereof and the salts thereof, and

5

(b) at least one active substance selected from the group consisting of inhibitors of platelet function such as in particular acetylsalicylic acid, fibrinogen receptor antagonists, inhibitors of ADP-induced aggregation,  $P_2T$  receptor antagonists and combined thromboxane receptor antagonists /  
 10 synthetase inhibitors, thrombolytically active substances, such as in particular alteplase, reteplase, tenecteplase, urokinase, staphylokinase and streptokinase, physiological activators and inhibitors of the clotting system and their recombinant analogues such as in particular Protein C, recombinant human activated Protein C, TFPI and antithrombin, substances  
 15 with an antagonistic effect on endotoxins, interleukins, TNF, bradykinin, prostaglandins, cyclooxygenases, NO, platelet activating factor acetylhydrolases, inflammation inhibitors, immunosuppressant substances, antibiotics and catecholamines

20 **16.** Pharmaceutical composition according to claim 15, comprised of  
 (a) (R)-2-(4-amidinophenylaminomethyl)-1-methyl-5-[1-(carboxymethylamino)-1-(pyrrolidinocarbonyl)-ethyl]-benzimidazole, optionally in the form of the pharmaceutically acceptable acid addition salts and optionally in the form of the hydrates or solvates thereof, and

25 (b) a PAF-AH or a PAF-AH derivative.

**17.** Pharmaceutical kit comprised of at least  
 (a) (R)-2-(4-amidinophenylaminomethyl)-1-methyl-5-[1-(carboxymethylamino)-1-(pyrrolidinocarbonyl)-ethyl]-benzimidazole, optionally in the  
 30 form of the pharmaceutically acceptable acid addition salts and optionally in the form of the hydrates or solvates thereof, and

(b) a PAF-AH or a PAF-AH derivative.

**18.** Pharmaceutical kit comprised of least

- 5 (a) (R)-2-(4-amidinophenylaminomethyl)-1-methyl-5-[1-(carboxymethylamino)-1-(pyrrolidinocarbonyl)-ethyl]-benzimidazole, optionally in the form of the pharmaceutically acceptable acid addition salts and optionally in the form of the hydrates or solvates thereof, and
- (b) a tumour necrosis factor alpha (TNF-alpha) antagonist.

- 10 **19.** Use of a PAF-AH or a PAF-AH derivative or a TNF-alpha antagonist for preparing a pharmaceutical composition for combined use with a (R)-2-(4-amidinophenylaminomethyl)-1-methyl-5-[1-(carboxymethylamino)-1-(pyrrolidinocarbonyl)-ethyl]-benzimidazole.